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National Systematics Laboratory Report for Calendar Year 1986

Washington, D.C.
May, 1987

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

ANNUAL REPORT

NATIONAL SYSTEMATICS LABORATORY

CALENDAR YEAR 1986

Washington, D.C.

May 1987

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary

National Oceanic and Atmospheric Administration
Anthony J. Calio, Under Secretary and Administrator

National Marine Fisheries Service
William E. Evans, Assistant Administrator for Fisheries

1986 HIGHLIGHTS

- Published research distinguishing two species of stone crabs (Menippe). The population in the northwestern Gulf of Mexico represents a previously undescribed species, Menippe adina.

- Published monograph on the 20 species of mud shrimps (Upogebia) from the eastern Pacific, 15 of which were new to science.

- Published monograph on the 18 species of halfbeaks occurring in Far East in cooperation with Prof. J. Su, visiting ichthyologist from Peoples Republic of China. Although not food fishes in U. S., halfbeaks are highly valued elsewhere in the world.

- Completed illustrated key to species of spiny and slipper lobsters sold in the U.S. One-third of the world catch is imported into U.S. Paper in press in Marine Fisheries Review.

- Completed illustrated identification key to American commercial species of penaeoid shrimps. Key treats 37 species of western Atlantic and eastern Pacific.

- Completed monograph on Indo-west Pacific gamba prawns, genus Pseudaristeus, including a description of two new species.

- Verified that two species of sand lances (Ammodytes) occur in the western North Atlantic, an inshore species in protected bays and estuaries from Delaware to Labrador and an offshore species from North Carolina to Greenland.

- Began research on squids and corals.

MISSION

The National Systematics Laboratory conducts taxonomic research on marine organisms of economic and ecological value to the United States. This involves describing and naming new species as well as revising existing names and descriptions based on new information. Since many species important to the United States are widespread or migratory, our research is world-wide.

Accurate taxonomic information is critical for the proper management of our nation's marine resources. Without a clear understanding of what individual species look like, where they live and what their names are, we cannot develop reasonable national fishing and conservation regulations, collect accurate statistics, set catch limits, or understand the behavior and ecology of these valuable species.

The National Systematics Laboratory is actively involved in studying the taxonomy of fishes, crustaceans, squids and corals. We have a permanent staff of four scientists, two technicians, a scientific illustrator, an administrative assistant, and a secretary.

We are located in the Smithsonian Institution's National Museum of Natural History in Washington, D. C. where we can take advantage of one of the world's leading systems of collections, libraries, equipment and facilities that are specifically geared for taxonomic research. The opportunity to meet and communicate with other taxonomic experts who reside in or visit the Smithsonian helps keep the staff of the National Systematic Laboratory current on the latest thoughts and techniques in the field. As Smithsonian Research Associates, National Systematic Laboratory scientists expand Smithsonian scientific capabilities and help build and curate Smithsonian collections.

The National Systematics Laboratory has two major responsibilities, research and service. Our research produces two major products: 1) worldwide and regional taxonomic monographs, and 2) aids to identification.

The National Systematics Laboratory serves many public as well as private institutions and individuals worldwide by providing expert identifications and information on species we study. We also review and comment upon manuscripts for scientific journals and colleagues in the National Marine Fisheries Service, other agencies, and academia. Our staff evaluates research proposals for the National Science Foundation and other research agencies.

In addition to these activities, staff members serve as officers of various scientific associations and participate in university affairs as research associates and adjunct professors.

HISTORY

The origin of the National Systematics Laboratory (NSL) can be traced back to August 15, 1942, when Samuel F. Hildebrand moved into the Division of Fishes of the National Museum of Natural History to continue his ichthyological research for the Department of Interior's Bureau of Fisheries following merger of the Bureau of Fisheries fish collection with that of the U.S. National Museum. The Laboratory, then the National Center for Systematics, was transferred from the the Department of Interior to the National Oceanic and Atmospheric Administration in 1970 and renamed the National Systematics Laboratory. The Laboratory is presently administered by the National Marine Fisheries Service Northeast Fisheries Center. It is responsible to the National Marine Fisheries Service Research Council and all four regional Fisheries Centers.

NSL activities are divisible into two major areas, research and service.

RESEARCH

Twenty papers were published by NSL scientists in calendar year 1986 (listed at end of this report). Research completed in 1986 and earlier has led to 12 more papers that are now in press or that are being reviewed. Major accomplishments in 1986 are listed below for each investigation.

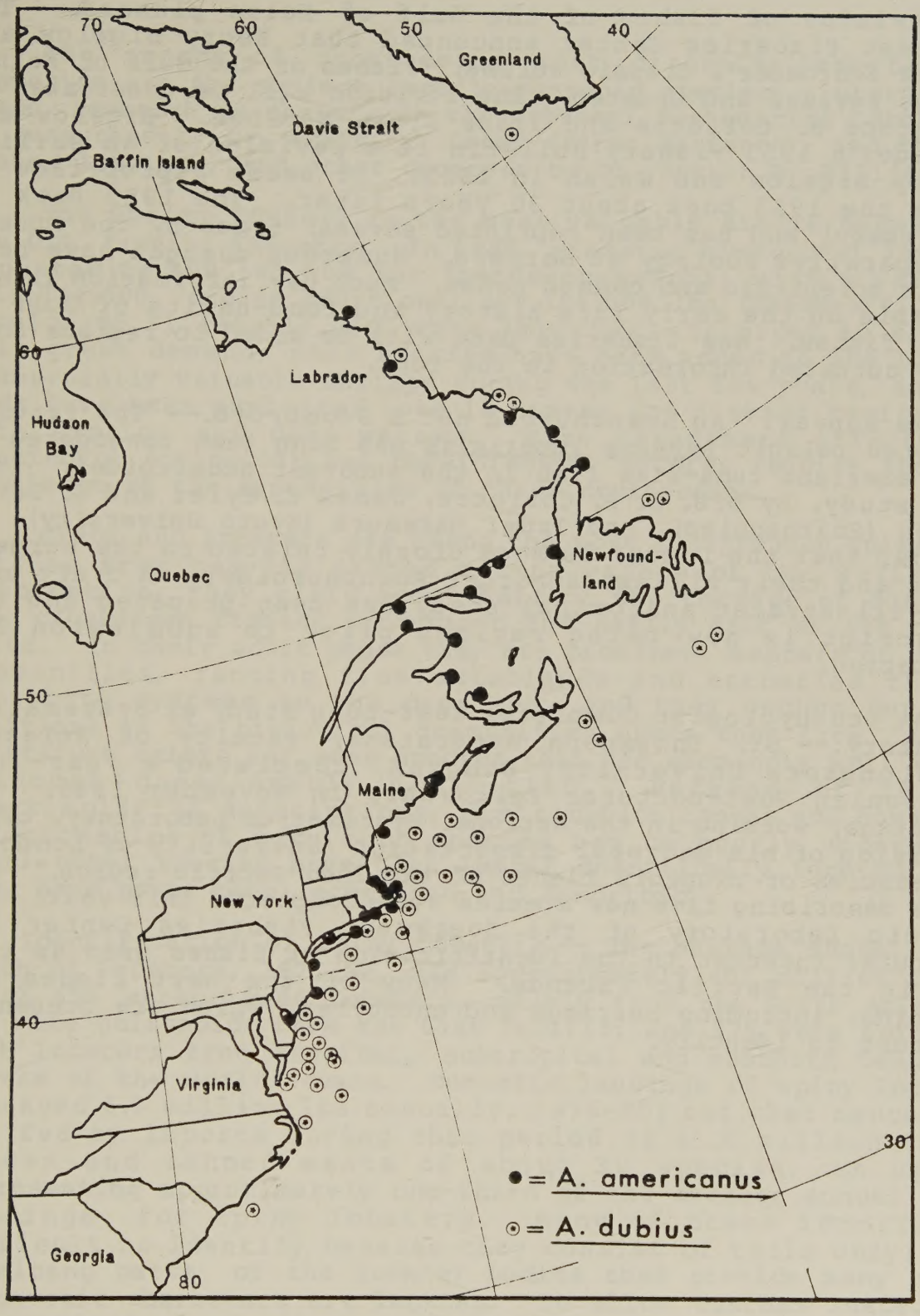
FISHES

Pelagic fishes of great importance to man live in the highly productive surface layers of the ocean where species tend to grow large and range widely. Particular emphasis is devoted to studying the anatomy and systematics of scombroids, the group that includes the tunas, Spanish mackerels, bonitos, and mackerels. Although many of the species have been known for a long time and an extensive literature treats them, detailed anatomical descriptions and comparisons are few, incorrect scientific names have often been used, geographical ranges for many are not precisely delimited, and poorly documented classifications are current. The giant tunas, bonitos and Spanish mackerels found around the world have been treated by Dr. Collette and colleagues in a series of monographs and papers. Also studied are the halfbeaks (family Hemiramphidae) and needlefishes (family Belonidae), abundant fishes which are important forage items and which are of local commercial importance as food and bait. Monographs on these two families are being prepared for the series, Fishes of the western North Atlantic.

1. Two species of Sand Lance (Ammodytes) occur in Northwest Atlantic.-- Twenty-three nominal species of sand lances have been described, although many recent workers follow Reay (1970) in recognizing only six species. Five of these species names have been applied in the Northwest Atlantic, but current workers disagree on both the number and the correct names of Ammodytes species in that area. Characters such as meristics and body depth and length, traditionally used to distinguish sand lance species, show considerable interspecific overlap, making identification on these bases difficult if not impossible. Preliminary results of a study by Betsy B. Washington indicate the presence of two species of sand lance in the NW Atlantic. An inshore form, A. americanus, occurs in protected bays and estuaries from Delaware to Labrador and an offshore form, A. dubius, is found in unprotected coastal waters from North Carolina to Greenland. Characters which confirm the distinctness of these two species include: number of pectoral fin rays, gill rakers, lateral skin folds (plicae), and vertebrae. To determine the distributional limits of species in the NW Atlantic, and their valid names, representatives are being compared with other Ammodytes species from around the world.

2. Two species of frigate tunas occur in Atlantic.-- Larval studies indicate that Auxis is more abundant than the larger commercial tunas of the genera Thunnus and Katsuwonus. Frigate tunas are, at present, not utilized in the U.S. but world production totals over 100,000 metric tons per year. Preliminary findings are that there are two world-wide species, the narrow corseleted frigate tuna, Auxis thazard, and the wide-corseleted frigate tuna or bullet tuna, Auxis rochei. Both species are easily distinguishable in the Indo-Pacific by the differences in width of the lateral line under the origin of the second dorsal fin (5 scales or less in A. thazard, 6 scales are more in A. rochei), distance between the anterior extension to the dorsal scaleless area to tip of pectoral fin (extends anterior to pectoral tip more than 2 mm in A. thazard, fails to reach pectoral tip in A. rochei), color pattern on back (oblique irregular lines in A. thazard, broad vertical bars in A. rochei), and other characters. Both species occur in the Atlantic, but A. thazard is much rarer in collections and A. rochei differs morphologically from Indo-Pacific populations of the species, making identification difficult.

3. Review of Far East Halfbeaks published.-- As part of a year-long visit to the National Systematics Laboratory and the Division of Fishes of the Smithsonian Institution, Dr. Jinxiang Su of the Shanghai Fisheries College collaborated with Dr. B. B. Collette on a review of halfbeaks found in the Far East. Eighteen species, one previously undescribed, in 6 genera are now reliably known from the Far East. Six of these species are restricted to that region. Although currently utilized only for bait and not for food in the United States, halfbeaks constitute an important group of food fishes in many other parts of the world such as China, Japan, Australia, and New Zealand.



Distribution of two species of sand lance (Ammodytes) in the western Atlantic Ocean.

4. Revision of fishes of the Gulf of Maine planned.-- The Northeast Fisheries Center announced that Henry Bigelow and William Schroeder's classic volume, "Fishes of the Gulf of Maine" will be revised and updated. The revision will be undertaken by Drs. Bruce B. Collette and Grace Klein-MacPhee. Bigelow and Schroeder's 1953 Fishery Bulletin is a revision of an earlier work by Bigelow and Welsh in 1925. It seems appropriate to revise the 1953 book about 30 years later. The 1953 book is still useful and has been reprinted several times by the Museum of Comparative Zoology at Harvard. Numerous changes have been made in scientific and common names. Much new information is now available on the early life history and food-habits of Gulf of Maine fishes. New fisheries data will be added to replace some of the outdated information in the book.

5. The Louvar: An Acanthuroid not a Scombroid.-- The rarely-collected pelagic Luvarus imperialis has long been considered to be an aberrant tuna-like fish in the suborder Scombroidei. In a joint study, by Drs. B. B. Collette, James C. Tyler and G. David Johnson (Smithsonian), and Izumi Nakamura (Kyoto University), it is shown that the louvar is most closely related to the surgeon fishes and their allies, suborder Acanthuroidei. A draft of a fully-illustrated anatomical study has been prepared and the manuscript is now being revised prior to submission for publication.

6. Thai Ichthyologist Completes Year-Long Study at Systematics Laboratory.-- Dr. Thosaporn Wongratana, Faculty of Science, Chulalongkorn University, Bangkok, completed a year-long Smithsonian Post-Doctoral Fellowship in November 1986. Dr. Wongratana, working in the National Systematics Laboratory, began a revision of his doctoral dissertation (University of London), "Systematics of clupeoid fishes of the Indo-Pacific region." Two papers describing five new species were completed this year. The Honolulu Laboratory of the Southwest Fisheries Center has particular interest in the identification of fishes used as tuna bait in the Pacific islands. Many of the bait fishes are clupeoids, including herrings and anchovies, which are presently difficult to identify.

CRUSTACEANS

The groups of crustaceans most directly important to fisheries are the shrimps (mainly penaeoid species), lobsters and crabs. Research on shrimps in the National Systematics Laboratory is conducted by Dr. Isabel C. Canet (Perez Farfante), and that on crabs, lobsters, and other decapods by Dr. Austin B. Williams.

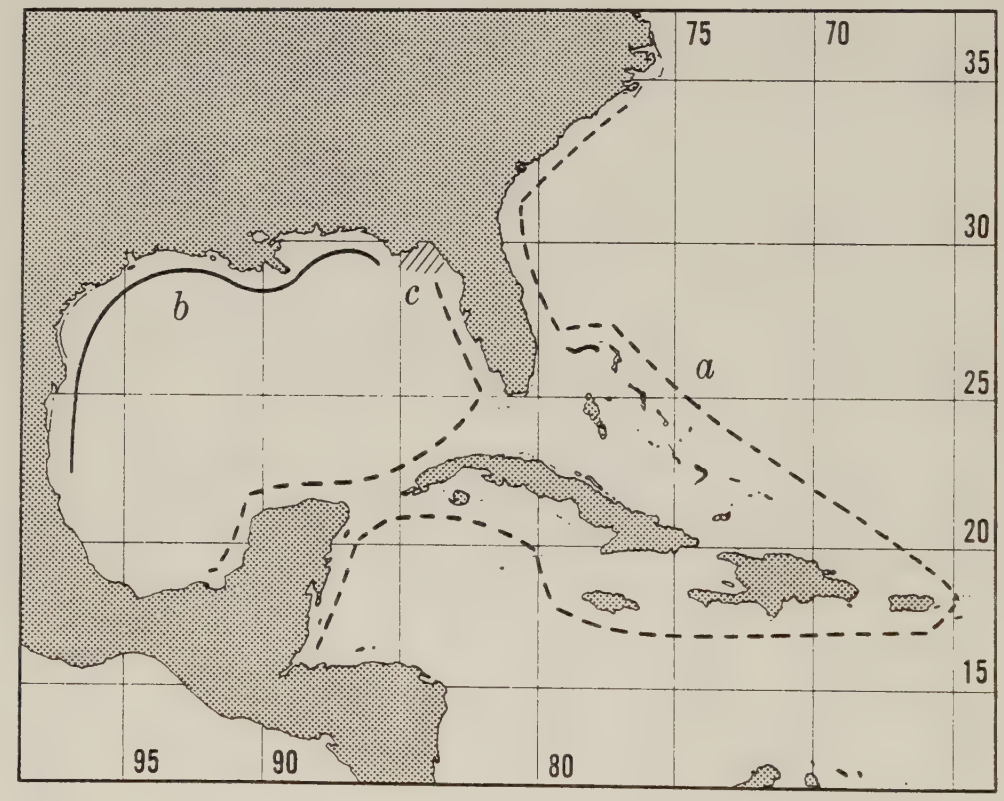
The shrimp fishery is the most valuable single segment of the U.S. fishing industry. In 1986, domestic commercial landings amounted to 400,185,000 lbs (heads-on-weight) with a value of $662,744,000, and an additional 400,106,000 lbs (heads-off), with a value of $1,434,337,000, were imported. In order to satisfy this great demand, more species have been added to the list of commercially valuable shrimps during the last few years, and new beds have been exploited both in nearby and distant regions, in both shallow and deep waters. Wise management efforts and meaningful ecological and physiological studies require thorough knowledge of the systematics of these crustaceans.

Crabs and lobsters are among the most conspicuous animals in catches from heavily fished marine waters of the world. In combination, they yield about half of the tonnage of domestic U.S. crustacean fishery production and nearly half of its dollar value. In their adult phase they are prominent members of bottom communities, ranging from marshlands and estuaries through nearshore systems to the deep sea, and they occupy dominant positions in the biological communities where they live. A huge literature exists for some species that are seemingly well known, although questionably identified. Because of faulty, oversimplified descriptions, distribution ranges and community relationships of many such species may be poorly understood. Still other species have been lumped uncritically together, and many have never been recognized and described.

1. Identification of Spiny Lobsters.-- The average annual world catch of lobsters, 1975-82, was approximately 401 million lbs of which 45% were clawed lobsters, mainly from the North Atlantic, 18% were galatheids from the east Pacific, and 37% were spiny and flat lobsters from tropical, subtropical and southern temperate waters of the world oceans. Domestic landings of spiny lobsters averaged 6.0 million lbs annually, 1976-85; but that amount was dwarfed by imports during that period of 41.6 million lbs of frozen and canned meats of about 30 species, an amount representing approximately one-third of the average annual world landings for spiny lobsters. Many of these imports are difficult to identify because they consist of tails only; the remaining parts of the lobster bodies that provide many useful diagnostic characters are lacking. To allow customs inspectors, representatives of other regulatory agencies, and importers, to identify the imports properly (and to ascertain country of origin), Dr. A. B. Williams has produced illustrated keys for the identification of all species of lobsters that are prominent in U. S. trade as well as species that have minor or potential

commercial value. The keys and illustrations, some in color, represent the species as they may be seen in fresh or frozen state. The manuscript is in press in the Marine Fisheries Review.

2. Second Species of Stone Crab Discovered.-- The stone crab, known until now as Menippe mercenaria (Say), was presumed to range in the western North Atlantic from Cape Lookout, N.C. to the Greater Antilles and Belize, and around the Gulf of Mexico to Tamaulipas State, Mexico, in shallow subtidal depths to a maximum of 50 meters. Dr. A. B. Williams in collaboration with Dr. D.L. Felder, University of Southwestern Louisiana, has shown that the population in the northern Gulf of Mexico is a previously undescribed species named M. adina. The U.S. fishery for these prized crabs, mainly along the west coast of Florida, grew from reported landings of 752,000 lbs, $233,000, in 1964 to 3,274,000 lbs, $3,071,000, in 1977 (published 1984), but then declined to 1,700,000 lbs in 1984-85.



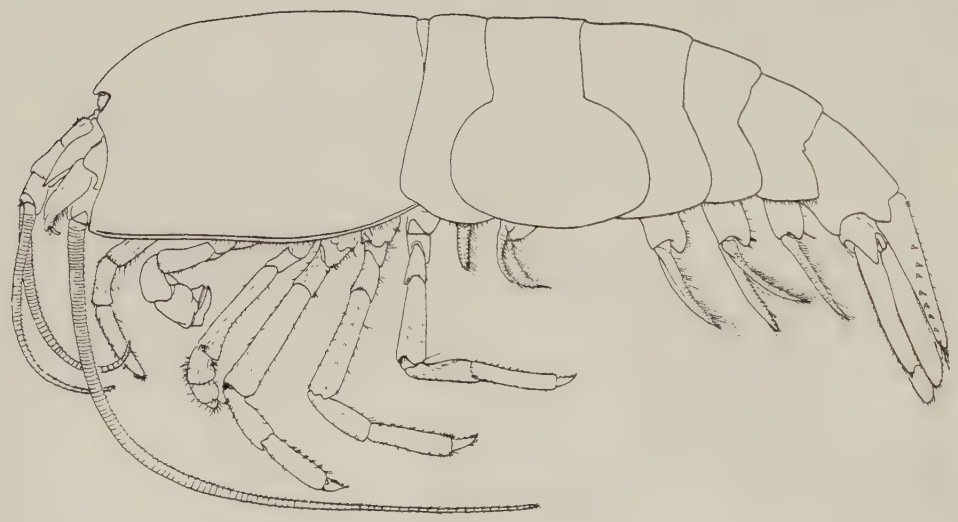
Gulf of Mexico, parts of western North Atlantic Ocean and Caribbean Sea showing geographic ranges of: a, Menippe mercenaria; b, M. adina; c, zone of hybridization.

3. Eastern Pacific Mud Shrimp Monograph Published.-- A revision of the mud shrimps (Upogebia) found in the eastern Pacific between Alaska and the Galapagos Islands was published by Dr. A. B. Williams. Twenty species were described and illustrated from this region which extends over 9700 kilometers of latitude, embracing seven zoogeographic provinces. Fifteen of the species were new to science, and one was an abortive introduction from the western Atlantic, possibly imported with oysters. Keys for identification of these species, as well as the six species known from the western Atlantic, are included. These filter-feeding, tube-dwelling shrimps were abundant in benthic samples taken during a survey of shallow marine ecosystems of Panama in the 1970's that was related to proposed construction of a transisthmian sea-level canal. The ecological importance of infaunal decapod crustaceans is only beginning to be realized, for the diversity and density of species in this cryptic environment are great. The genus treated here has been judged to have its greatest development in the tropical Indo-Pacific, but the western hemisphere is richer in species than heretofore realized, with complementary development on both sides of the continent.

Upogebia longipolles (Streets). Female, lateral view

4. Illustrated Key to American Penaeoid Shrimps Completed.-- Currently, it is difficult to identify certain of the 37 economically valuable species of penaeoid shrimps of the eastern Pacific and western Atlantic. To enable a wide variety of users to identify these shrimps more easily, Dr. I. Pérez Farfante has prepared a key that includes more than 100 illustrations. The Southeast Fisheries Center has helped to support her work. The key is being revised prior to submission for publication.

5. New Species of Shrimps Described from Mid-Atlantic Ridge.-- As part of continuing studies on the crustaceans associated with hydrothermal vents, Dr. A.B. Williams in collaboration with Dr. P.A. Rona, NOAA Atlantic Oceanographic & Meterological Laboratory, Miami, described two new species of the genus Rimicaris. Four species of shrimps have now been described from vent systems of the Pacific and Atlantic oceans.



Rimicaris chacei Williams and Rona, lateral view

6. Revision of the Gamba Prawn Genus Pseudaristeus.-- A monograph of the genus Pseudaristeus was completed by Dr. I. Pérez Farfante. This wide-ranging group includes six species; two of them were previously unknown to science and a third was known only as juveniles; five have commercial potential. The large series, obtained mostly from surveys by U.S. vessels in the Pacific, has made possible the assessment of taxonomic status and interrelationships of these prawns based on numerous new diagnostic characters. The paper is in press in the Fishery Bulletin.

7. Wood Panels Submerged in Deep Sea Attract Squat Lobsters.-- Four species of squat lobsters, genus Munidopsis, were recovered from mesh-enclosed wood panels placed near experimental "wood islands" in the deep western Atlantic and retrieved with the aid of the deep submersible research vessel ALVIN. Samples of two of these species were large enough to allow regression analysis of carapace width and short carapace length. Speculations on growth rates were determined from animals trapped within the mesh bags for known periods of time. Results of the study were published by Dr. A. B. Williams in collaboration with Dr. R. D. Turner, Museum of Comparative Zoology, Harvard University.

8. Cretaceous Fossil Spiny Lobsters, Counterparts Of Living Indo-Pacific Descendants.-- The fossil spiny lobster, Linuparus canadensis, is common in the Cretaceous Carlile Shale north of the Black Hills, South Dakota. The species and its fossil animal associates form an assemblage that is remarkably constant, both in composition and preservation in shales of the region. From collaborative studies, Dr. G. A. Bishop, Georgia Southern College, and Dr. A. B. Williams have concluded that this lobster is the predominant crustacean and one of the predominant fossils in the assemblage preserved there, that this group is analogous to similar fossil assemblages dominated by crabs, and that living and fossil species of the genus Linuparus probably share at least some ecological similarities. The modern species are fished to limited extent. Results of the study were published in National Geographic Research.

9. Systematics Laboratory Shrimp Biologist Retires.-- Dr. Isabel C. Canet (Pérez Farfante) retired after more than 45 years as a marine biologist, the last 20 years with the National Systematics Laboratory. Born in Cuba, educated at the University of La Habana and Radcliffe College, where she received her doctorate, she taught in Cuba, authored a textbook and became Director of the Cuban Fisheries Research Center, "Centro de Investicagiones Pesqueras". She, her husband and two sons left other family and Cuba for the United States after the Cuban revolution went communistic in 1960. As a leading world authority on shrimps, Dr. Pérez Farfante published over 70 scientific papers, two of which were nominated for the Fishery Bulletin's "Best Publication" award. Although officially retiring from government service, she will continue her research in emeritus status with the National Systematics Laboratory and as a research associate of the Smithsonian Institution. Dr. Pérez Farfante is presently working on a key and list of the genera and subgenera of the world penaeoid and sergestoid shrimps.

SQUIDS

Squid fisheries, both in U.S. waters and worldwide, concentrate on species from two families, Loliginidae and Ommastrephidae. Loliginids include many species of demersal squids which attain medium to large sizes and which are both common and abundant on continental shelves. The loliginids in U.S. waters include species which are harvested commercially but which are quite difficult to identify. Additionally, there are several other species of small loliginids found in U.S. waters. The generic relationships of the species are presently very confused. Four conflicting classification schemes have been proposed, based either on single characters or on regional material. Because the diverse family Loliginidae is cosmopolitan, the only way to resolve relationships within it adequately is by a worldwide systematic review of the taxonomic characters. Dr. Vecchione is undertaking such a review.

Commercially and ecologically, the most important ommastrephids in U.S. waters belong to the genus Illex. There are four groups of Illex in the western Atlantic which are more or less distinct morphologically. It has been proposed that these morphotypes are separate species, although some authors still consider them to be subspecies. These arguments, based primarily upon preserved specimens, have not fully considered other components of morphological variability (e.g. geographic, seasonal, sexual, ontogenetic). Dr. Vecchione is beginning a study of Illex which will treat several components of variability from fresh as well as preserved material.

Much of Dr. Vecchione's past work has focused on the early life history of squids. Because this subject has received little attention during the past half century, it holds great promise for advances in squid systematics and biology. Dr. Vecchione is continuing his research on paralarval squids, including use of the squids collected on the MARMAP ichthyoplankton project.

CORALS

Corals and coral ecosystems are important sources of esthetic and recreational enjoyment, habitat for commercially harvested finfish and shellfish, material for curio items and objects d'art, and specimens for scientific and educational inquiry. Coral resources are subject to adverse effects associated with channel dredging, vessel anchoring and groundings, recreational diving, specimen collecting, commercial fishing, offshore oil and gas development, municipal and industrial waste outfalls, land runoff, and other human activities.

Threats to domestic coral resources pose difficult management problems which are currently addressed through a patchwork of state and federal regulatory and management programs. Foremost among these programs are those concerned with managing state and federal parks, marine sanctuaries, commercial fisheries, offshore mineral development, and coastal zone development.

Efficient management and regulation and accurate ecological and physiological research depends on a thorough knowledge of systematics. Early taxonomic workers had a restricted amount of material at their disposal and often based their designation of species on single specimens or, at most, a small series. They did not appreciate that the majority of corals show a considerable range of variations in skeletal characters. Thus, early taxonomic work led to an unnecessarily complicated situation that is still in the process of being disentangled today.

1. Skeletal Variation in the Poritidae off Belize.-- Corals of the genus Porites are among the most abundant species in the world and one of the most taxonomically confused. Lt. Cdr. Jameson's research is the first step in a multidisciplinary study to clarify the taxonomy of the Caribbean and Atlantic Poritidae. A multivariate statistical analysis is underway to:

1) cluster specimens with similar morphologies,
2) quantify the skeletal variability in these morphological clusters
3) identify the skeletal characters of most importance in distinguishing morphotypes and,
4) determine the relative importance of environmental versus genetic influences over skeletal morphology.

The results of this research will help develop an identification key that will be of practical use and will also help develop new techniques that can be applied to other problematic species.

SERVICE

The primary service functions of this Laboratory are to provide expert identifications for groups of fishes, crustaceans, squids and corals in which we specialize and to furnish information on these animals. We assist visitors in the use of the national collections. We review manuscripts for scientific publications, for colleagues in NMFS, and other agencies. Finally, we assist staffs of the divisions of Fishes, Crustacea, Molluscs and Echinoderms with curation and loans, especially of material collected by NMFS.

IDENTIFICATIONS

Organization	Contact
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NMNH, Naturalist Center, SI	Staff
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National Geographic Society, DC	J. Davidson
National Taiwan Univ. Museum	S.-C. Chen
Osprey Books, NY	I. Doré
Commercial fisherman, Morehead City, NC	J. Dodrill
Mar Azul, S.A.	S. Horton
Dominican Republic, San José	D. Wetherbee
Commercial Nature Photographer, Tucson, AZ	A. Kerstitch
University of Michigan Museum of Zoology	S. Goodman

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NMFS, Galveston, TX	R. Zimmerman
NMFS, Office Utilization Research, DC	J. Brooker
NMFS, Miami, FL	F. Berry
NMFS, Oxford , MD	E. Christopher
Natl. Oceanographic Data Center, DC	R. Burrows
U.S. Fish & Wildlife Service, Missoula, MT	C. Servheen
U.S. Dept. of Agriculture, DC	E. Collins
Florida State Legislature, Tallahassee	S. Hernández; R. Wilhelm
Smithsonian Environmental Lab. MD	A. Hines
Virginia Marine Resources Comm. Npt. News	L. Varnell
National Zoo, DC	H. Child
Florida Dept. of Natural Resources	S. Otwell
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Kent State University, OH	R. Feldmann
Museum of Natural History, Leiden, NETH.	L. Holthuis
Indonesia Agricultural University	K. Aziz
Universidad de Quito, Ecuador	P. Cordero
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Stanford University, CA	B. Rinkovitch
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Universidad de Rio Grande do Sul, BRAZIL	L. Chao
University of Maryland, College Pk.	R. Menzer
University of Maryland, Cambridge	E. Houde
University of Maryland, College Pk.	C. Mitter; E. Russek
Virginia Inst. of Marine Science, Gl. Pt.	T. Munroe
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Newfound Harbor Marine Institute, FL	J. Thomas
Nature Conservancy International, Guayaquil	M. Hurtado
Instituto del Mar del Perú, Lima	M. Méndez
African-American Institute, Seychelles	B. Mouline; S. Harrison
Inst. de Ciencias del Mar y Limnol., MEX	M. Hendrickx
Banco Central República Dominicana	G. Torres
World Book Encylopedia, Chicago, IL	B. Lacey; F. Ford
Inst. Ciencias del Mar, Barcelona, SPAIN	E. McPherson
Marine Systems, S. CA	D. Farrier
Mileace General Trading Inc.	A. Latif
American Museum of Natural History, NY	C. Smith

MANUSCRIPTS REVIEWED

Reviews of 36 manuscripts were provided for:

Publication

Proc. Biological Society of Washington (7)
Fishes of the Western North Atlantic (12)
Bulletin of Marine Science (2)
Oceanológica Acta (3)
Estuarine Variability, An Overview (Book)
Geological Society of America, Book
Smithsonian Contributions to Zoology
Environmental Biology of Fishes
University of Chicago, Geophysical Sciences
Smithsonian Magazine
Journal of Crustacean Biology (2)
Copeia (2)
Proc. Academy of Natural Sciences, Philadelphia
Ann. del Instituto de Ciencias del Mar y Limnología

Manuscripts were also reviewed for 19 authors at their request.

RESEARCH PROPOSALS REVIEWED

Seventeen research proposals were reviewed for the following 7 organizations.

Organization

National Science Foundation (7)
NOAA, Estuarine Sanctuary Program
NOAA, National Underwater Research Program
Smithsonian Institution, postdoctral fellowships (4)
American Chemical Society
University of Texas
Center for Field Research (2)

PROFESSIONAL MEETINGS

STONE CRAB SYMPOSIUM

Dr. Williams attended the symposium on stone crab biology and fisheries at the Mote Marine Laboratory, Sarasota, April 23-25 and presented a paper on the results of his collaborative research identifying a previously undescribed species of stone crab in the Gulf of Mexico.

37TH ANNUAL TUNA CONFERENCE

Dr. Collette attended the 37th Annual Tuna Conference at Lake Arrowhead, CA, May 18-21. He presented a paper distinguishing the two worldwide species of frigate tunas (Auxis) and described geographical variation in each species.

GORDON RESEARCH CONFERENCE

Dr. Williams acted as Vice Chairman of the Gordon Conference "Estuarine Processes: Chemical and Biological Interactions," Plymouth State College, Plymouth, NH, June 8-13.

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

Dr. Collette attended the annual meeting of the American Society of Ichthyologists and Herpetologists at the University of Victoria in Victoria, British Columbia, June 15-21. He participated in the meeting of the Board of Governors as past-president of ASIH and presented a paper on his research on the frigate tuna genus Auxis. During 1986, he served on the Raney Award Committee which provides financial support to worthy ichthyological research projects of graduate students.

GUILD OF NATURAL SCIENCE ILLUSTRATORS

Keiko Hiratsuka Moore attended the International Conference of the Guild of Natural Science Illustrators at the National Museum of Natural History, June 15 to 21.

NORTH AMERICAN PALEONTOLOGICAL CONVENTION IV

Dr. Williams attended the IV North American Paleontological Convention, held at the University of Colorado, Boulder, August 16-20 and followed this with several days of field work in Cretaceous Rocks of South Dakota with Dr. Gale A. Bishop, Georgia Southern College, Statesboro, and a field party studying fossil crustaceans.

AMERICAN FISHERIES SOCIETY

Dr. Collette attended the annual meeting of the American Fisheries Society in Providence, RI, Sept. 14-18. As a member of the Publication Overview Committee, he also participated in a meeting of this committee with the Executive Committee of AFS in Boston on Feb. 10.

WILLI HENNIG SOCIETY

Dr. Collette participated in the annual meeting of the Willi Hennig Society at the American Museum of Natural History, Nov. 7-10, as a Fellow of the Society. He presented a joint paper with Dr. Joseph Russo entitled "The stability of classification and phylogenetic uncertainty: Scombroidei, a case study".

AMERICAN SOCIETY OF ZOOLOGISTS

Drs. Collette and Williams attended the annual meeting of the American Society of Zoologists in Nashville, Dec. 27-30. Dr. Williams attended sessions of the Crustacean Society, Dr. Collette sessions of the Division of Vertebrate Morphology, and both attended sessions of the Society of Systematic Zoology. Dr. Williams is Secretary of the Society of Systematic Zoology and Dr. Collette is a member of the Council.

UNIVERSITY AFFAIRS

BERMUDA BIOLOGICAL STATION

Dr. Collette taught a four-week course, "Biology of Fishes," at the Bermuda Biological Station in August. The class included fishery students from India, Italy, Great Britain, and the U.S.

NORTHEASTERN UNIVERSITY

Dr. Collette was reappointed as Adjunct Professor of Biology at Northeastern University.

VIRGINIA INSTITUTE OF MARINE SCIENCE

Dr. Collette served as a member of the Ph.D. committee for Thomas Munroe and participated in the thesis defense in November. Dr. Collette also presented a seminar on his work on phylogeny of scombroid fishes.

HARVARD UNIVERSITY

Dr. Collette was reappointed as Research Associate in the Department of Ichthyology, Museum of Comparative Zoology, Harvard University.

UNIVERSITY OF PENNSYLVANIA

Dr. Collette presented a lecture on the diversity and anatomy of fishes to a class at the Veterinary School of the University of Pennsylvania in Philadelphia.

OTHER ACTIVITIES

FISHERY BULLETIN

Dr. Collette continued as a member of the Editorial Committee and the Outstanding Publications Committee. He also participated in a meeting of the NMFS Publication Advisory Committee in Seattle Dec. 11-12 to explain the results of an A-76 study of NMFS Technical Publications and Editorial service that he conducted in 1986.

SMITHSONIAN INSTITUTION

Dr. Collette served as Research Associate in the Department of Vertebrate Zoology, and Drs. Canet and Williams in the Department of Invertebrate Zoology. Dr. Vecchione was appointed Research Associate in the Department of Invertebrate Zoology. Dr. Williams served as a member of the Oceanographic Sorting Center Arthropod Advisory Committee.

AMERICAN ASSOCIATION FOR ZOOLOGICAL NOMENCLATURE

Dr. Collette served as President-elect of the American Association for Zoological Nomenclature. Members of the Council are employed by agencies that rely on nomenclature in their research and service work - National Marine Fisheries Service; Fish and Wildlife Service; Parasitology and Systematic Entomology laboratories of the U.S. Department of Agriculture; National Museum of Natural History; and U.S. Geological Survey.

BIOLOGICAL SOCIETY OF WASHINGTON

Dr. Williams served as President for 1986-87. He and Dr. Collette participated in Council meetings and the annual meeting.

AFS COMMITTEE ON COMMON NAMES OF AQUATIC INVERTEBRATES

In early 1982, the American Fisheries Society Committee on Common and Scientific Names of Aquatic Invertebrates (CCSNAI) was formed to study and propose methods for standardizing common names for aquatic invertebrates of America north of Mexico. Common names are governed by no recognized codes, as are Latin names, and multiple synonyms or homonyms often exist among common names of species having special interest to man. The confusion which can result from these cases may be of little consequence locally, but in trade, for example, where Canadian and United States market or customs regulations apply, single adopted common names (official names) must be used for the purposes of unambiguous recognition.

Under chairmanship of Drs. Robert F. Hutton, and Donna D. Turgeon, NMFS, a committee of persons from NMFS, state and university organizations has developed a set of working "Principles Governing Selection of Common Names of Aquatic Invertebrates from America North of Mexico," and is now coordinating preparation of lists of common names for coelenterates, mollusks, echinoderms and decapod crustaceans. Dr. Williams wrote and revised several drafts of the "Principles" (adapted from the AFS List of Common and Scientific Names of Fishes from the United States and Canada, 4th ed.) and is chairing a subcommittee of the Crustacean Society responsible for designating common names of decapod crustaceans. Dr. Canet prepared the list of penaeoid shrimps. The list will be published by the American Fisheries Society to encourage acceptance of uniform common names.

DAUPHIN ISLAND SEA LAB

Dr. Williams presented an invited seminar on decapod crustaceans from hydrothermal vents, July 2-3.

FISHES OF THE WESTERN NORTH ATLANTIC

Dr. Collette continued to serve as Chairman of the Editorial Board of this monographic series. A meeting was held at the Academy of Natural Sciences in Philadelphia with the editor of part 9 which will deal with the eels.

JOURNAL OF CRUSTACEAN BIOLOGY

Dr. Williams began a 5-year term as an associate editor.

CYBIUM

Dr. Collette continued as a member of the editorial board of Cybium, Bulletin de la Societe Française d'Ichtyologie.

NATIONAL SYSTEMATICS LABORATORY PUBLICATIONS 1986

Bishop, G.A. and A.B. WILLIAMS. 1986. The fossil lobster Linuparus canadensis, Carlile Shale (Cretaceous), Black Hills. National Geographic Research 2(3):372-387.

COHEN, D. M. 1986. Families Bregmacerotidae, Moridae, and Melanonidae. In: Fishes of the north-eastern Atlantic and Mediterranean. P.J.P. Whitehead et al., eds., UNESCO, 2:711-724.

----------. 1986. Families No. 61, Argentinidae, pp. 215-216; No. 62, Bathylagidae, p. 216; No. 91, Melanonidae, pp. 320-329; No. 88, Gadidae, p. 324; No. 89, Merlucciidae, pp. 325-326; No. 90, Moridae, pp. 326-328; and No. 98 Bythitidae, pp. 354-356. In: Smith's Sea Fishes, M. M. Smith and P. C. Heemstra, eds. Macmillan South Africa, Johannesburg, 1047 pp.

COLLETTE, B. B. 1986. Resilience of the fish assemblage in New England tidepools. Fish. Bull., U.S. 84(1):200-204.

----------. 1986. Hemiramphidae. In: Check-list of the freshwater fishes of Africa. J. Daget, J.-P. Gosse, and D.F.E. Thys van den Audenaerde, eds. 2:163-164.

----------. 1986. Families Coryphaenidae and Scombridae. In: Fishes of the north-eastern Atlantic and Mediterranean. P.J.P. Whitehead et al., eds., UNESCO, 2:845-846, 981-997.

----------. 1986. Families No. 113, Belonidae, pp. 385-387; No. 115, Hemiramphidae, pp. 388-391; and No. 249, Scombridae, pp. 831-838. In: Smith's Sea Fishes, M. M. Smith and P. C. Heemstra, eds., Macmillan South Africa, Johannesburg, 1047 pp.

----------. 1986. Revision of the frigate tunas, genus Auxis. Proc. 37th Ann. Tuna Conf., Southwest Fish. Center. Admin. Rept. H-86-19:35. (Abstract).

----------. 1986. [Obituary]. Sally Leonard Richardson, 1944-1986. Copeia 1986(4):1043-1045.

---------- and R. F. Cressey. 1986. Occurrence of Caligus coryphaenae on Thunnus thynnus by Hogans (1985): Corrections (Copepoda, Caligidae). Crustaceana 51(1):220.

---------- and N. V. Parin. 1986. Families Belonidae and Hemiramphidae. In: Fishes of the north-eastern Atlantic and Mediterranean. P.J.P. Whitehead et al., eds., UNESCO,

---------- and J. L. Russo. 1986. Systematic status of the suborder Scombroidei. In: Indo-Pacific Fish Biology: Proc. 2nd Int. Conf. Indo-Pacific Fishes, p. 938 (Abstract).

---------- and J. Su. 1986. The halfbeaks (Pisces, Beloniformes, Hemiramphidae) of the Far East. Proc. Acad. Nat. Sci. Philadelphia 138(1):250-302.

PÉREZ FARFANTE, I., and B. B. Boothe, Jr. 1986. Redescription and range extension of the shrimp Parapenaeopsis balli (Decapoda: Penaeidae). J. Crustacean Biol. 6(3):401-407.

Tyler, J.C., G. D. Johnson, I. Nakamura, and B. B. COLLETTE. 1986. Luvaris imperalis (Luvaridae): An oceanic acanthuroid. In: Indo-Pacific Fish Biology: Proc. 2nd Int. Conf. Indo-Pacific Fishes, p. 960 (Abstract).

WILLIAMS, A. B. 1986. Mud shrimps (Upogebia) of the eastern Pacific (Thallasinoidea: Upogebiidae). San Diego Soc. Nat. Hist. Mem. 14:1-60.

----------. 1986. Foreword. In D. A. Wolfe (ed.), Estuarine variability. Academic Press, N.Y.

---------- and D. L. Felder. 1986. Analysis of stone crabs: Menippe mercenaria (Say), restricted, and a previously unrecognized species described (Decapoda: Xanthidae). Proc. Biol. Soc. Washington 99(3):517-543.

---------- and P. A. Rona. 1986. Two new caridean shrimps (Bresiliidae) from a hydrothermal field on the Mid-Atlantic Ridge. J. Crustacean Biol. 6(3):446-462.

---------- and R. D. Turner. 1986. Squat lobsters (Galatheidae: Munidopsis) associated with mesh-enclosed wood panels submerged in the deep sea. J. Crustacean Biol. 6(3): 617-624.

IN PRESS

COHEN, D. M. Families Argentinidae, Bathylagidae, Melanonidae, Moridae, Gadidae, and Bregmacerotidae. In: Check-list of Fishes of the eastern Tropical Atlantic. J. C. Quero, ed., UNESCO.

COLLETTE, B. B. Family Scombridae. In: Check-list of Fishes of the eastern Tropical Atlantic. J. C. Quero, ed., UNESCO.

---------- and N. V. Parin. Families Belonidae and Hemiramphidae. In: Check-list of fishes of Eastern Tropical Atlantic. J. C. Quero, ed., UNESCO.

Grier, H. J., and B. B. COLLETTE. Unique spermatozoa in testes of halfbeaks belonging to the genus Zenarchopterus (Teleostei: Hemiramphidae). Copeia 1987(2).

WILLIAMS, A. B. Lobsters--identification, world distribution, and U. S. trade. Mar. Fish. Rev. 48(2).

---------- Indo-Pacific spiny lobsters in the U. S. National Museum of Natural History, collected from 1963 to 1981. Crustaceana.

---------- A commensal mud shrimp from sponges in the western Central Atlantic (Decapoda: Upogebiidae). Proc. Biol. Soc. Washington 100.

---------- More records for species of shrimps, Rimicaris (Decapoda: Caridea: Bresiliidae) from the mid-Atlantic Rift. J. Crustacean Biol. 7.

COMPLETED MANUSCRIPTS

COLLETTE, B. B., and K. W. Hartel

An annotated list of the fishes of Massachusetts Bay. (records 131 species in 63 families, 97 pp., 1 fig., 1 table).

PEREZ FARFANTE, I.

Revision of the gamba prawn genus Pseudaristeus, with description of two new species (Crustacea: Decapoda: Penaeoidea). (65 pp., 49 figs., accepted for Fish. Bull.).

Tyler, J. C., G. D. Johnson, I. Nakamura, and B. B. COLLETTE

Osteology and relationships of the oceanic fish Luvarus imperalis (Luvaridae): an acanthuroid, not a scombroid. (147 pp., plus 36 figs.)

WILLIAMS, A. B.

Decapod and euphausiid crustaceans from outer continental shelf and upper slope of the eastern United States. (Submitted to Fish. Bull., 14 pp., 3 figs., 1 table,).

STAFF

Bruce B. Collette	Laboratory Director and Ichthyologist
Stephen C. Jameson	Assistant Laboratory Director and Corallist
Isabel C. Canet (Pérez Farfante)	Carcinologist Emeritus (Retired in 10/86)
Austin B. Williams	Carcinologist
Michael Vecchione	Squid Biologist (after 12/86)
Ruth E. Gibbons	Museum Technician
Arleen S. McClain	Administrative Assistant and Secretary
Grace Klein-MacPhee	Fishery Biologist (after 11/86)
Keiko H. Moore	Scientific Illustrator
Virginia R. Thomas	Secretary
Betsy B. Washington	Museum Technician
Thosaporn Wongratana	Visiting Research Ichthyologist (Professor, Faculty of Science, Chulalongkorn University, Bangkok) (to 11/86)